Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection

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Table 15h. Antiretroviral Therapy-Associated Adverse Effects and Management Recommendations—Lipodystrophies and Weight Gain (Last updated April 14, 2020; last reviewed April 14, 2020) (page 1 of 2)

Adverse Effects	Associated ARVs	Onset/Clinical Manifestations	Estimated Frequency	Risk Factors	Prevention/Monitoring	Management
Lipodystrophy (Fat Maldistribution) General Information	See below for specific associations.	**Onset:** • Increase in trunk and limb fat are the first sign; peripheral fat wasting may not appear for 12–24 months after ART initiation.	Frequency is low (<5%) with current regimens.	Genetic predisposition Puberty HIV-associated inflammation Older age Longer duration of ART Body habitus	**Prevention:** • Initiate a calorically appropriate, low-fat diet and an exercise regimen. **Monitoring:** • BMI measurement • Waist circumference and waist-hip ratio	Physicians should perform a regimen review and consider changing the regimen when lipodystrophy occurs. Improvement in fat maldistribution can vary following a regimen change. Improvement may occur after several months or years, or it may not occur at all.
Central Lipohypertrophy or **Lipo-accumulation**	Can occur in the absence of ART, but these conditions are most often associated with the use of PIs and EFV.	**Presentation:** • Central fat accumulation with increased abdominal girth, which may include a dorsocervical fat pad (buffalo hump). Gynecomastia may occur in males or breast hypertrophy may occur in females, particularly with the use of EFV.	Frequency is low (<5%) with current regimens.	Obesity before initiation of therapy Sedentary lifestyle	**Prevention:** • Initiate a calorically appropriate, low-fat diet and an exercise regimen. **Monitoring:** • BMI measurement • Waist circumference and waist-hip ratio	Counsel patient on lifestyle modification and dietary interventions (e.g., maintaining a calorically appropriate diet that is low in saturated fats and simple carbohydrates, and starting an exercise regimen, especially strength training). Recommend smoking cessation (if applicable) to decrease future CVD risk. Consider using an INSTI instead of a PI or EFV, although some INSTIs may be associated with generalized weight gain (see below). **Data are Insufficient to Allow the Panel to Safely Recommend Use of Any of the Following Modalities in Children:** • Recombinant human growth hormone • Growth hormone-releasing hormone • Metformin • Thiazolidinediones • Recombinant human leptin • Anabolic steroids • Liposuction

Table 15h. Antiretroviral Therapy-Associated Adverse Effects and Management Recommendations—Lipodystrophies and Weight Gain (Last updated April 14, 2020; last reviewed April 14, 2020) (page 2 of 2)

Adverse Effects	Associated ARVs	Onset/Clinical Manifestations	Estimated Frequency	Risk Factors	Prevention/Monitoring	Management
Facial/Peripheral Lipoatrophy	Most cases are associated with the use of ZDV, a thymidine analogue NRTI.	**Presentation:** • Thinning of subcutaneous fat in the face, buttocks, and extremities, measured as a decrease in trunk/limb fat by DXA or triceps skinfold thickness. Preservation of lean body mass distinguishes lipoatrophy from HIV-associated wasting.	Frequency is low (<5%) with current regimens.	Underweight before ART initiation	**Prevention:** • Limit the use of ZDV. **Monitoring:** • Patient self-report and physical examination are the most sensitive methods of monitoring lipoatrophy.	Replace ZDV with another NRTI when possible. **Data are Insufficient to Allow the Panel to Safely Recommend Use of Any of the Following Modalities in Children:** • Injections of poly-L-lactic acid • Recombinant human leptin • Autologous fat transplantation • Thiazolidinediones
Weight Gain	Significant weight gain may occur with all ARV regimens, but it appears to be more pronounced with DTG, BIC, and TAF.	Gradual weight gain after initiating ARV drugs is common with all currently used regimens. The mechanism for weight gain is unclear and is under investigation.	Rate of development of obesity is unclear.	**In Adults:** • Low pre-treatment BMI • Older age • Female sex • Black race Risk factors for weight gain have not yet been evaluated in infants and children.	**Prevention:** • Initiate a calorically appropriate, low-fat diet and an exercise regimen. **Monitoring:** • BMI measurement • Waist circumference and waist-hip ratio	Counsel patient on lifestyle modification and dietary interventions (e.g., maintaining a calorically appropriate, healthy diet that is low in saturated fats and simple carbohydrates, and starting an exercise regimen, especially strength training).

Key: ART = antiretroviral therapy; ARV = antiretroviral; BIC = bictegravir; BMI = body mass index; CVD = cardiovascular disease; DTG = dolutegravir; DXA = dual energy x-ray absorptiometry; EFV = efavirenz; INSTI = integrase strand transfer inhibitor; NRTI = nucleoside reverse transcriptase inhibitor; PI = protease inhibitor; TAF = tenofovir alafenamide; ZDV = zidovudine

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See the archived version of Supplement III, February 23, 2009, Pediatric Guidelines on the AIDS*info* website for a more complete discussion and reference list.

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